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EXAMINER

ALI, MOHAMMAD

ART UNIT

PAPER NUMBER

2166

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/017,783

Applicant(s)

ABDO ET AL.

Examiner

Mohammad Ali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 August 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-10 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. This communication is in response to the amendment filed on 08/11/05.

Claims 1-10 are pending in this Office Action.

### ***Response to Arguments***

2. After further search and a thorough examination of the present application claims 1-10 remain rejected.

Applicants' arguments with respect to claims 1-10 have been considered, but they are not deemed to be persuasive.

Applicant's argue that Chadha'495 do not teach the claimed features, "measure of entropy of attributes values and/or revalidating a prior statistics".

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Furthermore, in response to the Applicant's arguments the Examiner respectfully submits that Chadha'495 teaches this limitation as, a key for a derived or base table is a minimal set of columns that can uniquely determine a tuple in the table. That is, given two tuples with the same values on the key columns, the data values of the other non-key columns of these two tuples must be the same, see col. 4, lines 49-53, Chadh'495. The SQL statements received as input from the user specify only the data that the user wants, but not how to get to it. This step considers both the available access paths

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(indexes, sequential reads, etc.) and system held statistics on the data to be accessed (the size of the table, the number of distinct values in a particular column, etc.), to choose what it considers to be the most efficient access path for the query, see col. 7, lines 11-18, Chadha'495.

Chadha'495 does not explicitly indicate the claimed revalidating. Jones remedy such kinds of deficiency by teaching request is revalidated, and a query plan will be formulate. If receiver client access is authorized, the MOL received at the receiver client is transformed into a second MOL, and transferred to the receiver client, see col. 15, lines 10-15, Fig. 40, Jones). It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teaching would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57.

Revalidating as taught by Jones improves to access the object in an object server in response to the database query, see col. 2, lines 33-35, Jones. Chadha'495 and Jones does not explicitly indicate the claimed entropy. Chadha '46 discloses the claimed entropy (rules used for data mining will appreciate that the association measures can be Chi-square, entropy, see col. 5, lines 14-15). It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teachings and entropy of Chadha ('46) teachings would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57 and dimension reduction for

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data mining without the need for a domain expert as suggested by Chadha ('46) at col. 2, lines 67 to col. 3, lines 1).

Applicant's argue that Jones nothing suggest, "revalidating a prior statistics generated for a prior different selection criterion by the use of measure of entropy of [the] one or more attributes of a relation".

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Further, Examiner respectfully submits that combination of Chadha'495, Chadha'146 and Jones teaches particular limitations as stated above.

Hence, Applicants' arguments do not distinguish over the claimed invention over the prior art of record.

In light of the foregoing arguments, the 103 rejections are hereby sustained.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

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the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chadha et al. ('Chadha' hereinafter), US Patent 5,706,495 in view of Jones et al. ('Jones' hereinafter), US Patent 5,689,698 and further in view of Chadha et al. (Chadha ('46) hereinafter), US Patent 6,032,146.

With respect to claim 1,

Chadha discloses a method for revalidating previously generated statistics for a query directed to one or more attributes of a relation (see 7, lines 43-50, Fig. 3), comprising

identifying in said query a selection criterion on said one or more attributes of said relation (see col. 4, lines 45-46 et seq), and

revalidating a prior statistic generated for a prior different selection criterion on the same one or more attributes of said relation, based upon a measure of entropy of said one or more attributes of said relation (see col. 7, lines 11-20, Fig. 2 et seq).

Chadha does not explicitly indicate the claimed revalidating.

Jones discloses the claimed revalidating (request is revalidated, and a query plan will be formulate. If receiver client access is authorized, the MOL received at the receiver client is transformed into a second MOL, and transferred to the receiver client, see col. 15, lines 10-15, Fig. 40, Jones).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teaching would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57. Revalidating as taught by Jones improves to access the object in an object server in response to the database query, see col. 2, lines 33-35, Jones.

Chadha and Jones does not explicitly indicate the claimed entropy.

Chadha ('46) discloses the claimed entropy (rules used for data mining will appreciate that the association measures can be Chi-square, entropy, see col. 5, lines 14-15).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teachings and entropy of Chadha ('46) teachings would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57 and dimension reduction for data mining without the need for a domain expert as suggested by Chadha ('46) at col. 2, lines 67 to col. 3, lines 1).

As to claim 2,

Chadha teaches wherein said prior statistic is revalidated if a measure of entropy

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of said one or more attributes of said relation is less than a predetermined threshold ('input') value (see col. 7, lines 11-18 et seq).

As to claim 3,

Chadha teaches further comprising generating a measure for the entropy of said one or more attributes of said relation, by the steps of computing frequencies of different values for the one or more attributes in tuples of the relation (see col. 14, lines 2-15 et seq), and

combining the measured frequencies into a measure of the entropy of the attributes (see col. 13, lines 28-35).

As to claim 4,

Chadha teaches wherein generating a measure for the entropy of said one or more attributes of said relation further comprises collecting a sample of tuples of the relation, wherein frequencies of different values are computed for tuples in the sample (see col. 11, lines 37-45 et seq).

As to claim 5,

Chadha teaches wherein combining the measured frequencies comprises determining a number of distinct values for the one or more attributes, and converting the computed frequencies to probabilities by dividing the frequencies by number of distinct values (see col. 11, lines 37-45 and col. 9, lines 55-61 et seq).

As to claim 6,

Chadha teaches wherein combining the measured frequencies further comprises forming a weighted sum of the computed probabilities (see col. 11, lines 37-45 and col. 9, lines 55-61 et seq).

With respect to claim 7,

Chadha discloses a computer system implementing a relational database system and evaluating queries directed to said relational database (see 7, lines 43-50 and col. 9, lines 22-30, Fig. 3), comprising

storage for said relational database, including a relation having a plurality of tuples including values for a plurality of attributes (see col. 4, lines 45-46 et seq), and computing circuitry performing query optimization and query execution upon said relational database (see col. 3, lines 27-31), said query optimization including generating statistics for a query directed to one or more attributes of said relation, by identifying in said query a selection criterion on said one or more attributes of said relation (see 7, lines 43-50 and col. 9, lines 22-30, Fig. 3), by revalidating a prior statistic generated for a prior different selection criterion on the same one or more attributes of said relation, based upon a measure of entropy of said one or more attributes of said relation (see col. 7, lines 11-20, Fig. 2 et seq).

Chadha does not explicitly indicate the claimed revalidating.

Jones discloses the claimed revalidating (request is revalidated, and a query plan will be formulate. If receiver client access is authorized, the MOL received at the receiver client is transformed into a second MOL, and transferred to the receiver client, see col. 15, lines 10-15, Fig. 40, Jones).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teaching would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57. Revalidating as taught by Jones improves to access the object in an object server in response to the database query, see col. 2, lines 33-35, Jones.

Chadha and Jones does not explicitly indicate the claimed entropy.

Chadha ('46) discloses the claimed entropy (rules used for data mining will appreciate that the association measures can be Chi-square, entropy, see col. 5, lines 14-15).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teachings and entropy of Chadha ('46) teachings would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57 and dimension reduction for data mining without the need for a domain expert as suggested by Chadha ('46) at col. 2, lines 67 to col. 3, lines 1).

With respect to claim 8,

Chadha discloses a program product for implementing a relational database system and evaluating queries directed to said relational database (see 7, lines 43-50, Fig. 3), comprising

a relational database, including a relation having a plurality of tuples including values for a plurality of attributes (see col. 4, lines 45-46 et seq), and

relational database software performing query optimization and query execution upon said relational database (see col. 3, lines 27-31), said query optimization including generating statistics for a query directed to one or more attributes of said relation, by identifying in said query a selection criterion on said one or more attributes of said relation (see col. 5, lines 12-19), by revalidating a prior statistic generated for a prior different selection criterion on the same one or more attributes of said relation (see col. 7, lines 11-20, Fig. 2 et seq), based upon a measure of entropy of said one or more attributes of said relation, and a signal bearing media holding said relational database and relational database software (see 7, lines 43-50 and col. 9, lines 22-30, Fig. 3).

Chadha does not explicitly indicate the claimed revalidating.

Jones discloses the claimed revalidating (request is revalidated, and a query plan will be formulate. If receiver client access is authorized, the MOL received at the receiver client is transformed into a second MOL, and transferred to the receiver client, see col. 15, lines 10-15, Fig. 40, Jones).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teaching would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57. Revalidating as taught by Jones improves to access the object in an object server in response to the database query, see col. 2, lines 33-35, Jones.

Chadha and Jones does not explicitly indicate the claimed entropy.

Chadha ('46) discloses the claimed entropy (rules used for data mining will appreciate that the association measures can be Chi-square, entropy, see col. 5, lines 14-15).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references, because the revalidating of Jones teachings and entropy of Chadha ('46) teachings would have allowed Chadha's system to optimize the query plan as suggested by Jones at col. 7, lines 52-57 and dimension reduction for data mining without the need for a domain expert as suggested by Chadha ('46) at col. 2, lines 67 to col. 3, lines 1).

As to claim 9,

Chadha teaches wherein the signal bearing media comprises transmission media see 1, lines 6-11, Fig. 1).

As to claim 10,

Chadha teaches wherein the signal bearing media comprises recordable media see 1, lines 6-11, Figs. 1, 13).

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Contact Information***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammad Ali whose telephone number is (571) 272-4105. The examiner can normally be reached on Monday-Thursday (7:30 am-6:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain T. Alam can be reached on (571) 272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Mohammad Ali  
Primary Examiner  
Art Unit 2166

MA  
October 25, 2005